Amiga Mail

Volume II

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The Commodore Amiga Technical Newsletter

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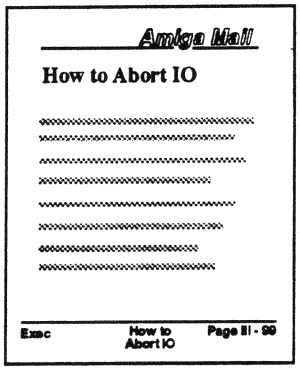
Amiga Mail
Volume II

Amiga Mail is published six times annually by the Commodore Applications and Technical Support Group (CATS). Its purpose is to support third-party developers of Amiga software and hardware world-wide by providing technical information and programming guidelines. Each issue features a collection of news and technical articles of special interest to Amiga product developers. The technical articles in each issue can be saved for future use in the Amiga Mail Tech Notes binder, a reference notebook containing all the articles from past issues of Amiga Mail.

For filing technical articles in the Amiga Mail Tech Notes binder, just use the chapter and page numbers listed in the footer of each article page. The Tech Notes chapter is shown as a Roman numeral followed by the page number within that chapter.



For instance, the article at right would be filed in chapter III of the Amiga Tech Notes binder, "Exec". The article starts on page 99 of that chapter in the binder.

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Amiga Mail News

EDC Set for Milan in February

The Fourth Annual European Developers Conference will be held in Milan, Italy from the 13th through the 16th of February at the Grand Hotel Brun. The deadline for registration is January 4th. Registration information along with a preliminary agenda will be sent to all registered developers in November.

Commodore ESCO has arranged for a hotel reservation service for the Grand Hotel Brun and an alternative hotel near by. The prices ESCO has negotiated are:

Grand Hotel Brun	Alternative hotel
180,000 Lira	160,000 Lira (Single)
250,000 Lira	210,000 Lira (Double)

Prices include breakfast and local value added tax.

Although the details haven't been finalized, the conference sessions are scheduled for the 13th through the 15th. The 16th has been set aside as "Show-off and Developers Forum Day". This day gives developers a chance to meet with Commodore and with each other to discuss their latest software and hardware projects and ideas.

ESCO is also considering video taping some of the more important sessions, giving developers the opportunity to see sessions that are scheduled for the same time. The application will include a ballot for attendees to vote on the sessions they most want to attend.

Welcome to Volume II

This issue marks the beginning of Amiga Mail's second volume. Amiga Mail is now dedicated to covering release 2 of the Amiga OS as well as the rest of Commodore's new Amiga hardware and software. Some of the new topics will include ARexx, networking, CDTV, and multimedia.

The new volume has also gone through some minor cosmetic changes as well, the most noticeable of which is in the format of code listings. Pages of code listings will be formatted as dual-columned landscape pages, much like the Includes and Autodocs appear in the *Includes and Autodocs Manual*. This method will compact lengthy source code listings, leaving room for more articles.

As with the first volume, a binder and tabs are available from CATS. The binder and tabs provide an easy way to save the articles for later reference. Certified developers and non-developers can purchase a new binder and tabs through the normal CATS channels. The price of the binder and tabs is $10 and $5, respectively.

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Virginia Tech Chooses Commodore for Unix Platform

Commodore Business Machines, Inc. scored a "pre-season" victory with an order for Unix-based Amiga 3000s by Virginia Tech. The Unix based Amiga has not been formally announced as a product.

Since 1984, the university has required their computer science majors to purchase a Unix-based computer system. At first the students had to buy Apple's Lisa, which ran a version of Unix from Unipress, but later, in 1987, the school switched to Apple's A/UX running on a 68020 based Macintosh. After examining Unix implementations on a variety of platforms, Virginia Tech decided to abandon the Apple configuration for Commodore's.

"This is a significant win for Commodore, because it clearly demonstrates that power and price-performance superiority of the Amiga 3000," said Howard Diamond, Commodore's Director of Education. "The marriage of the Amiga and V.4 technology is an exciting development for us and for our customers in higher education and other markets," he added.

Commodore's Unix is an implementation of AT&T's System V release 4. The design goal of System V release 4 (SVr4) is to integrate the features of the various existing Unix implementations into a unified standard. Over 150 companies have declared their support for SVr4. Unix technology, in general, is significant because it establishes common standards for the exchange of information between dissimilar hardware systems, an especially critical need for computer science and other university departments.

"Commodore's Unix passed every one of our tests," said Dr. James Arthur, chairman of the computer science department's selection committee. "From the Amiga technology to V.4 delivery to the Amiga's unbeatable price performance, Amiga Unix was the clear choice for our department. We're also very pleased with Commodore's willingness to work closely with us to produce a solution tailored to our needs." Virginia Tech selected Unix as their operating system standard because it provides an ideal environment for experimentation and because it is largely platform-independent.

Virginia Tech's purchase comes during the product's beta test phase. At press time, Amiga Unix platforms were not generally available.

Over the years, technology advances have prompted Virginia Tech's constant re-evaluation of the required platform. The selection of the Commodore Amiga is a realization of that re-evaluation process. According to Dr. Arthur, Virginia Tech is the only university in the country which requires its computer science majors to purchase a particular Unix platform. Computer science students become intimately familiar with the Unix operating system and underlying concepts found on a wide range of computers from mainframes to micros, and will use the Amiga to perform homework, in-class projects and term papers.

TagItems and Tag Lists

Staff

The implementation of tags is one of the many new features of release 2.0. Tags made it possible to add new parameters to system functions without interfering with the original parameters. They also make specifying parameter lists much clearer and easier.

A tag is made up of an attribute/value pair as defined below (from *utility/tagitem.h*):

```
struct TagItem
 {
     ULONG  ti_Tag;    /* identifies the type of this item */
     ULONG  ti_Data;   /* type-specific data, can be a pointer */
 };
```

The ti_Tag field specifies an attribute to set. The possible values of ti_Tag are implementation specific. System tags are defined in the include files. The value the attribute is set to is specified in ti_Data. An example of the attribute/value pair that will specify a window's name is:

```
ti_Tag  = WA_Title;
ti_Data = "My Window's Name";
```

The ti_Data field often contains 32-bit data as well as pointers.

One way tags are passed to system functions is in the form of *tag lists*. A tag list is an array or chain of arrays of TagItem structures. Within this array, different data items are identified by the value of ti_Tag. Items specific to a subsystem (Intuition, Graphics,...) have a ti_Tag value which has the TAG_USER bit set. Global system tags have a ti_Tag value with TAG_USER bit clear. The global system tabs include:

```
TAG_IGNORE - A no-op.  The data item is ignored.
TAG_MORE   - The ti_Data points to another tag list, to support chaining of TagItem arrays.
TAG_DONE   - Terminates the tag item array (or chain).
TAG_SKIP   - Ignore the current tag item, and skip the next n array elements, where
                n is kept in ti_Data.
```

Note that user tags need only be unique within the particular context of their use. For example, the attribute tags defined for OpenWindow() have the same numeric value as some tags used by OpenScreen(), but the same numeric value has different meaning in the different contexts.

System functions receive TagItems is several ways. One way is illustrated in the Intuition function OpenWindow(). This function supports an extented NewWindow structure called ExtNewWindow. When the NW_EXTENDED flag is set in the ExtNewWindow.Flags field, OpenWindow() assumes that the struct TagItem *Extension field contains a pointer to a tag list.

Another method of passing a tag list is to directly pass a pointer to a tag list, as OpenWindowTagList() does in the following code fragment.

```
struct TagItem tagitem[3];
struct Window *window;

tagitem[0].ti_Tag = WA_CustomScreen;
tagitem[0].ti_Data = screen;     /* Open on my own screen */
tagitem[1].ti_Tag = WA_Title;
tagitem[1].ti_Data = "AmigaMail Test Window";
tagitem[2].ti_Tag = TAG_DONE;    /* Marks the end of the tag array. */

/* Use defaults for everything else. Will open as big as the screen. */

if (window = OpenWindowTagList(NULL, /* Because all window parameters
                                      * are specified using tags, we don't
                                      * need a NewScreen structure */
                               tagitem))
{
    /* rest of code */
    CloseWindow(window);
}
```

Notice that window parameters need not be explicitly specified. Functions that utilize tags should have reasonable defaults to fall back on in case no valid attribute/value pair was supplied for a particular parameter. This fall back capability is a useful feature. An application only has to specify the attributes that differ from the default, rather than unnecessarily listing all the possible attributes.

The *amiga.lib* support library offers an example of another way to pass TagItems to a function. Rather than passing a tag list, the function OpenScreenTags() receives the attribute/value pairs in the argument list, much like printf() receives its arguments. Any number of attribute/value pairs can be specified. The following code fragment illustrates the usage of OpenScreenTags().

```
struct Screen *screen;

screen = OpenScreenTags(NULL, /* Don't bother with a NewScreen structure */
                        SA_Overscan, OSCAN_TEXT,
                        SA_Title, "Amiga Mail Screen",
                        TAG_DONE );
```

Tags are not exclusively for use with the operating system; the programmer can implement them as well. The run-time library *utility.library* contains several functions to make using tags easier. For more information on *utility.library*, see the appropriate release 2.0 Autodocs.

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Obtaining an Icon Image

By David N. Junod

One of the many improvements made to Workbench for release 2.0 lies in its ability to supply an application with arguments from Workbench. Prior to release 2.0, the only Workbench supported way an application could receive Workbench arguments was through the Workbench startup message. Now, Workbench arguments can come from many sources including AppWindows, AppIcons, and the ASL file requester. These enhancements have made processing Workbench arguments more beneficial than ever.

When an application is started via Workbench, the application receives a startup message (struct WBStartup) from Workbench. This message contains a pointer to an array of WBArg structures. The array of WBArgs corresponds to all Workbench icons that were selected at the time the application was launched. Each WBArg structure contains a file lock on the file or directory associated with each icon, as well as the name associated with the icon. A WBArg supplies the link to the icon, or the DiskObject, itself, from which necessary information, such as application or project ToolTypes, can be extracted.

Under release 2.0, Workbench supplies WBArgs using several different structures. The structure used depends on the source of the WBArgs. When it launches an application, Workbench sends the application WBArgs through the WBStartup structure. AppWindows and AppIcons use the AppMessage structure to send WBArgs. The ASL file requester provides the arguments in the FileRequester structure.

Also with release 2.0, it is possible that icons passed to an application do not have an *.info* file associated with them. Workbench can now display *all* files and directories iconically, not just those with *.info* files. For icons without *.info* files, Workbench supplies a default icon based on the protection bits and object type (file, dir, etc.) so the user can manipulate files and directories from Workbench.

The following routine uses GetDiskObjectNew() which should be used only when an application requires an image for every Workbench argument, whether actual or default. To only read actual icons and tooltypes, modify the routine to use GetDiskObject() instead. For more information, see the release 2.0 Autodocs.

```
/* wbarg.c
 * How to get an icon from a Workbench argument
 * Written by David N. Junod, 27-Aug-90
 */

#include <exec/types.h>
#include <exec/memory.h>
#include <exec/libraries.h>
#include <libraries/dos.h>
#include <workbench/icon.h>
#include <workbench/startup.h>
#include <clib/dos_protos.h>
#include <clib/exec_protos.h>
#include <clib/wb_protos.h>
#include <pragmas/dos.h>
#include <pragmas/exec.h>
#include <pragmas/wb.h>
#include <string.h>

extern struct Library *IconBase, *DOSBase;

struct DiskObject *GetDiskObjectNew (STRPTR name);
struct DiskObject *GetDiskObject (STRPTR name);

#pragma libcall IconBase GetDiskObjectNew 84 801

/****** wbarg/IconFromWBArg ******************************************
*
*   NAME
*      IconFromWBArg - Obtains the icon from a Workbench argument.
*
*   SYNOPSIS
*      dob = IconFromWBArg (wbarg);
*
*      struct DiskObject *dob;
*      struct WBArg *wbarg;
*
*   FUNCTION
*      Given a valid Workbench argument, this command will return the
*      proper icon.  This call uses the new (V36) GetDiskObjectNew call
*      to ensure that an icon will be returned.
*
*      This functions requires dos.library and icon.library to be opened
*      by the application.
*
*   INPUTS
*      wbarg  - Pointer to a filled in WBArg structure.
*
*   RESULTS
*      dob    - Pointer to a DiskObject structure.  Application must call
*               FreeDiskObject when done with the icon.
*
*********************************************************************/

struct DiskObject *IconFromWBArg (struct WBArg * arg)
{
    struct DiskObject *dob = NULL;
    UBYTE work_name[34];
    BPTR old, new;

    /* Copy the WBArg contents */
    strcpy (work_name, arg->wa_Name);

    /* Duplicate the lock */
    if (new = DupLock (arg->wa_Lock))
    {
       BOOL success = FALSE;

       /*
        * If we don't have a name, then get one. Only Tools & Projects have a
        * valid name.
        */
       if (strlen (work_name) == 0)
       {
           LONG msize = sizeof (struct FileInfoBlock);
           struct FileInfoBlock *info;

           /* This block needs to be longword aligned, so allocate it */
           if (info = (struct FileInfoBlock *) AllocMem (msize, MEMF_CLEAR))
           {
              /* Examine the lock, so that we can figure out the name */
              if (Examine (new, info))
              {
                  /* Copy the name of the lock */
                  strcpy (work_name, info->fib_FileName);

                  /* See if the lock is a directory */
                  if (info->fib_DirEntryType > 0)
                  {
                     /* Unlock the existing lock */
                     UnLock (new);

                     /* Go to the parent drawer */
                     if ((new = ParentDir (arg->wa_Lock)) == NULL)
                     {
                         /* A disk icon was passed */
                         strcpy (work_name, "disk");
                         new = DupLock (arg->wa_Lock);

                     }       /* End of if disk */
                  }          /* End of if directory */

                  /* We have a name */
                  success = TRUE;

              }              /* End of examine */

              /* Free the temporary block */
              FreeMem ((APTR) info, msize);
           }
       }
       else
       {
           /* Show that we have a name to work with */
           success = TRUE;
       }

       /* See if we should try getting the icon */
       if (success)
       {
           /* go to the directory where the icon resides */
           old = CurrentDir (new);

           /*
            * GetDiskObjectNew is a new function, for AmigaOS version 2.0,
            * therefore we need to check the version level.
            */
           if (IconBase->lib_Version >= 36)
              dob = GetDiskObjectNew (work_name);
           else
              dob = GetDiskObject (work_name);

           /* go back to where we used to be */
           CurrentDir (old);
       }

       /* release the duplicated lock */
       UnLock (new);
    }

    /* return the icon */
    return (dob);
}
```

❖

An Introduction to V36 Screens and Windows

by Ewout Walraven

Editor's Note: The following article assumes the reader is familiar with the concept and implementation of tags in Intuition under release 2.0. More information on the subject can be found in the Amiga Mail article "TagItems and Tag Lists".

The new *intuition.library* provides the programmer with flexible yet simple methods of opening Intuition screens and windows. This article is an introduction to some of the Intuition and relevant *graphics.library* functions that make this possible. For more in depth information see the 1990 DevCon notes as well as the Autodoc and include files for release 2.0.

The Display Database

Release 2.0 of the OS introduces system support for different monitor types and programmable display modes. Applications can make use of these features through the *Display Database*. The Display Database provides an easy way for applications to stay compatible with past, present and future versions of the OS and the display hardware.

The database contains information about the available monitor types (like PAL or VGA) and the display modes that a particular monitor type is capable of displaying (like Lores, Hires, SuperHires, etc). This database makes it possible for the user to dynamically add new monitor types to the system, typically by calling the *addmonitor* command using a monitor spec file as an argument. These monitor types will be added to the database after the default monitor. The default monitor properties are determined at boot time based on the configuration of the custom chip set. The default monitor is always either an alias for the NTSC or PAL monitor type.

When a monitor type is added to the database, the system figures out which display modes are available to this monitor type, based on the properties of the monitor's spec file and the configuration of the custom chip set. Later, the Display Database can be queried on the availability of a particular display mode using the appropriate *graphics.library* calls.

The following is an example of how to use *graphics.library* functions to find out what display modes are available. See the 2.0 Autodocs for a detailed description of the various functions.

```
ULONG modeID;
ULONG skipID;

ULONG error, result;
struct DisplayInfoHandle displayhandle;
struct DisplayInfo displayinfo;
struct NameInfo nameinfo;

/* graphics.library must be opened */

/* Don't want duplicate entries in the list for the
 * 'default monitor', so we'll skip the the videomode
 * for which default.monitor is the alias.
 */

/* INVALID_ID indicates both the start and the end of the list of
   available keys */
modeID = INVALID_ID;

GetDisplayInfoData(NULL, (UBYTE *) & displayinfo,
        sizeof(struct DisplayInfo), DTAG_DISP, LORES_KEY);
if (displayinfo.PropertyFlags & DIPF_IS_PAL)
    skipID = PAL_MONITOR_ID;
else
    skipID = NTSC_MONITOR_ID;


/* Given a ModeID, NextDisplayInfo
                returns the next ModeID in the list */
while((modeID = NextDisplayInfo(modeID)) != INVALID_ID) {

    /* Skip it? */
    if (modeID & MONITOR_ID_MASK != skipID) {

        /* ModeNotAvailable returns NULL if a displaymode,
           specified by the modeID, is available, or an error
           indicating why it is not available.
        */
        if ((error = ModeNotAvailable(modeID)) == NULL) {

            /* This displaymode is available, get the naming
               information. GetDisplayInfoData, can either be
               called with a handle to a displaymode record, or
               the display modeID. Never use the handle directly.
            */

            /* returns NULL if not found */
            if (displayhandle = FindDisplayInfo(modeID)) {
                result = GetDisplayInfoData(displayhandle,
                        (UBYTE *)&nameinfo, sizeof(struct NameInfo),
                        DTAG_NAME, NULL);
                if (result)     /* 'result' indicates the number
                                   of bytes placed in the buffer */
                    printf("%s is available.\n", nameinfo.Name);
            }
        }
    }
}
```

Using the GetDisplayInfoData() function, this example asks only for the descriptive name of the display mode via the NameInfo structure. Using this same function with a different tag, other information on a particular display mode can be obtained. GetDisplayInfoData() can supply information about the properties of the display mode (DisplayInfo), the display mode's dimensions (DimensionInfo) or the display mode's monitor specifications (MonitorInfo). Refer to *graphics/displayinfo.h* for a description of the various structures.

Opening Screens and Windows

Intuition V36 supplies two new functions to open screens and windows: OpenScreenTagList() and OpenWindowTagList(). They provide added functionality over the older OpenScreen() and OpenWindow() functions. Instead of the NewScreen and NewWindow structures, an array of parameters called *tags* is passed to the function in the form of a TagItem structure pointer. This array is known as a *tag list*. For a description of using tags in Intuition, see the Amiga Mail article "TagItems and Tag Lists".

The following is a simple example of the usage of OpenScreenTagList() and OpenWindowTagList(), using only a tag list as a parameter to each function.

```
struct TagItem tagitem[3];
struct Screen *screen;
struct Window *window;

tagitem[0].ti_Tag  = SA_DisplayID;
tagitem[0].ti_Data = HIRES_KEY;      /* Use HIRES displaymode
                                        for default monitor */
tagitem[1].ti_Tag  = SA_Title;
tagitem[1].ti_Data = "AmigaMail Test Screen";
tagitem[2].ti_Tag  = TAG_DONE;       /* Marks the end of the tag array. */

/* All others options will be set to default. Note this screen will not
   open with the 'New Look', due to the absence of the SA_Pens tag and
   data. Further examples will have this tag */

if (screen = OpenScreenTagList(NULL,   tagitem)) {
    tagitem[0].ti_Tag = WA_CustomScreen;
    tagitem[0].ti_Data = screen;     /* Open on my own screen */
    tagitem[1].ti_Tag = WA_Title;
    tagitem[1].ti_Data = "AmigaMail Test Window";
    tagitem[2].ti_Tag = TAG_DONE;    /* Marks the end of the tag array. */

    /* Use defaults for everything else. Will open as big as the screen. */

    if (window = OpenWindowTagList(NULL, tagitem)) {

        /* rest of code */

        CloseWindow(window);
    }
    CloseScreen(screen)
}
```

See the *intuition/intuition.h* and *intuition/screens.h* include files for a complete list of currently supported tags.

Intuition.library provides a function to get information about screens and display modes called GetScreenDrawInfo(). This function returns a subset of the data supplied by the *graphics.library*'s GetDisplayInfoData() function. Given a pointer to a screen, GetScreenDrawInfo() returns a pointer to a DrawInfo structure describing that screen. Note that this structure is ***read-only***. The DrawInfo structure contains information about the resolution, default font and pen colors of the screen. Since the system allocates the DrawInfo structure when GetScreenDrawInfo() is called, a program must tell the system to free it by calling FreeScreenDrawInfo(). Of course, a program should only release the DrawInfo structure after it is no longer needed.

When using GetScreenDrawInfo() on a public screen, the screen should first be locked using Intuition's LockPubScreen() function. This will prevent a public screen from closing while your program is looking at the screen's DrawInfo structure. UnlockPubScreen() will unlock the screen. Public screens are discussed in more detail later in this article.

The *graphics.library* function GetVPModeID() provides a way of determining the display mode ID associated with a ViewPort. Passed the ViewPort attached to a screen, the function will return the display mode ID for that ViewPort, or `INVALID_ID` if no display mode ID is associated with the ViewPort.

An example of the usage of GetVPModeID() and the other functions discussed so far in this article are provided in at the end of thisarticle in example 1, *CloneWorkbench.c*. This example also uses the stack-based *amiga.lib* support library functions OpenScreenTags() and OpenWindowTags(), both of which are documented in the release 2.0 Autodocs.

Public Screens

V36 introduces the *public* screen, a custom screen on which other applications can open their windows. A familiar example of a public screen is the Workbench screen. The public screen provides the ability to create system supported environment alternatives to the Workbench.

Opening a public screen is just like opening a custom screen. The only difference is in the tags used when the screen is opened. There must be a `SA_PubName` tag, with the screen's name as the tag's data. Applications will access the screen by this name. When a public screen is first opened, it is still private to the application that opened it. This will give the program that opened the screen the opportunity to set up before other applications can access the screen.

After a public screen is explicitly made public, anybody can put a lock on the screen or open a window on it. Both locks and 'visitor windows' prevent applications from closing their public screens. Intuition keeps track of the number of locks and visitor windows on a public screen by incrementing and decrementing the screen's visitor count. When the number of visitors is zero, the screen can be closed.

The following code fragment shows how to open a public screen and change its status from private to public using the Intuition function PubScreenStatus().

```
if (pubscreen = OpenScreenTags(NULL, SA_DisplayID, HIRES_KEY,
                    SA_Depth, 2, SA_Title, "AmigaMail Test Public Screen",
                    SA_PubName, "AmIgaMail Test Public Screen",
                    /* By providing the public name, you indicate
                       it will be public */
                    SA_Pens, dri_Pens,
                       SA_ErrorCode, &oserror,
                       TAG_END)) {
    /* change mode from 'private' to 'public' */
    oldstatus = PubScreenStatus(pubscreen, 0);}
```

If for any reason Intuition could not open the screen, the error number will be returned in the data portion of the `SA_ErrorCode` tag (the OpenScreen errors are listed in *intuition/screens.h*). This error can indicate that the system is out of memory, that the requested display mode is not supported by the video hardware or monitor, or that the public screen name is already being used by another public screen.

Some OpenScreen errors can be avoided. Make sure the display mode a screen requires is available (one of the previous examples shows how to find all available display modes). For example, before opening a public screen, make sure its name is not already being used by an existing public screen. Before opening a public screen named *ExamplePublicScreen*, try to put a lock on a screen with that name using LockPubScreen(). If this call succeeds, the system has found and locked a screen with that name, so you can't use it. If the call fails, the system does not have a screen by that name, indicating that it's OK to open the new screen with that name. An application should make sure it removes all locks on a screen when the screen is no longer needed.

If a screen already exists with that name, there are several options available, all of which should reflect user preferences. One option is not to open a screen, using the existing screen instead. For example, if the user double-clicks an application's project icon, the application would check if its public screen is already opened and open windows there before trying to open a new screen. Another option is to open a new screen with a slightly different name. A public screen that would have been named *ExamplePublicScreen* might instead be called *ExamplePublicScreen2*. A third option is to quit. In any case, the user should normally be choosing the actions of the application, not the programmer.

Programs find specific public screens by their name, so public screens must have a unique name as identification. With a maximum name length of 139 characters, supplying a unique name shouldn't be a problem. This name should reflect the nature of the screen's purpose, if for no other reason, to make it easy to figure out what the screen is used for. Ambiguous names such as "PublicScreen" or "MyScreen" should not be used as they tell nothing about the nature of the screen. Also, more than one "less creative" programmer might be inclined to give such generic names to their public screen, which can confuse both user and application.

As a public screen can be used as an alternative to the Workbench environment, programs opening public screens should normally make the screen is at least 640 pixels wide. Many applications assume that the Workbench is at least 640x200 and would be severely crippled if opened on a 320x200 screen.

Before a public screen can be closed, it has to be made private again. As long as there are visitors (windows and locks) on a public screen, an attempt to change the screen's status to private will fail. To make closing down public screens easier, Intuition can signal an application when the last visitor 'leaves' a public screen. While waiting to close a locked public screen, an application can start to shut down by unloading code or closing windows. After the screen has been made private again, Intuition removes it from the public screen list. The following code illustrates this.

```
if ((oldstatus = PubScreenStatus(pubscreen, PSNF_PRIVATE)) & PSNF_PRIVATE)
        CloseScreen(pubscreen);
```

To tell Intuition to signal when all the visitor windows on a public screen have been closed, use the SA_PubSig and SA_PubTask tags when opening the screen. The SA_PubSig data is the number of a signal bit you have allocated. An application can specify which task to signal when all the visitors have left by supplying a pointer to that task with the SA_PubTask tag. If this tag is absent or its data = NULL, the task which opened the public screen will be signaled.

When putting up any requesters on a public screen, be sure to supply the requester with a pointer to a visitor window on that screen. This will prevent the requester from popping up on the wrong screen. This will also prevent needless incrementing of the public screen's visitor count as the requester will not be considered a visitor.

Prior to release 2.02, UnlockPublicScreen() did not signal when the visitor count reached zero. With release 2.02, UnlockPubScreen() will signal the specified task when the visitor count reaches zero. Under 2.00 and 2.01, only CloseWindow() would signal.

There is always a default public screen available. Normally this would be the Workbench, but an application can make its own public screen the default, or better yet, a screen manager utility could let the user choose the default public screen. An application should not automatically make its public screen the default as this might confuse the user and can conflict with user preferences.

Because older programs do not know about public screens, The SHANGHAI flag has been provided to 'shanghai' requests to open a window on the Workbench screen, forcing the window to open on the default public screen. Of course, a release 2.0 application that wants to open a window on a specific public screen can do so provided that the specific screen is available. Another flag, POPPUBSCREEN, instructs Intuition to move public screens to the front if a window is opened on it. The SHANGHAI and POPPUBSCREEN flags can be set using PubScreenStatus() but, as the flags are global and should be set according to the preferences of the user, applications should not be changing them.

Example 2, Pub.c, shows how to open a public screen, make it the default and shut it down. The example can be found at the end of this article.

To aid 'screen manager' utilities, the list of public screens can be locked and copied using LockPubScreenList(). UnlockPubScreenList() will unlock the list. Don't try to interpret the list itself. Instead, copy it and release the lock. To receive an updated copy later on, lock and copy the list again. The following is a small example of locking the public screen list.

```
/*
 * V36 Lock public screen list example
 *
 * Compiled with SAS C 5.10:  lc -cfist -v -L locklist.c
 * Use V36 include files.
 *
 */

#include <string.h>

#include <intuition/intuition.h>
#include <intuition/screens.h>
#include <exec/memory.h>
#include <exec/lists.h>

#include <clib/intuition_protos.h>
#include <clib/exec_protos.h>
#include <clib/alib_protos.h>

void main (void);

struct IntuitionBase *IntuitionBase;

void main(void)
{

    struct List *publist;
    struct List *copy_publist;
    struct PubScreenNode *psnode;
    struct PubScreenNode *copy_psnode;

    /* fails silently if not V36 */
    if (IntuitionBase = OpenLibrary("intuition.library", 36)) {
        if (copy_publist = AllocMem(sizeof(struct List), MEMF_CLEAR)) {
            NewList(copy_publist);

            /* Lock the public screen list */
            publist = LockPubScreenList();

            /* and copy it */
            for (psnode = (struct PubScreenNode *)publist->lh_Head;
                 psnode->psn_Node.ln_Succ;
                 psnode = (struct PubScreenNode *)psnode->psn_Node.ln_Succ) {
                if (copy_psnode = AllocMem(sizeof(struct PubScreenNode), MEMF_CLEAR)) {
                    /* Copy the structure */
                    *copy_psnode = *psnode;

                    /* ln_Name points to the public screen name, make your own copy */
                    if (copy_psnode->psn_Node.ln_Name =
                            AllocMem(strlen(psnode->psn_Node.ln_Name) + 1, MEMF_CLEAR))
                        strcpy(copy_psnode->psn_Node.ln_Name, psnode->psn_Node.ln_Name);
                    else
                        printf("Not enough memory to copy screen name\n");

                    AddTail(copy_publist, (struct Node *)copy_psnode);
                } else {
                    printf("out of memory\n");
                    break;
                }
            }
            UnlockPubScreenList();

            psnode = (struct PubScreenNode *)copy_publist->lh_Head;
            while (copy_psnode = (struct PubScreenNode *)psnode->psn_Node.ln_Succ) {
                printf("%s\n", psnode->psn_Node.ln_Name);

                printf("psn_Screen       0x%lx\n", psnode->psn_Screen);
                                                    /* a pointer to the public screen */
                printf("psn_Flags        0x%lx\n", psnode->psn_Flags);
                                                    /* the flags */
                printf("psn_VisitorCount %ld\n", psnode->psn_VisitorCount);
                                                    /* the number of visitorwindows */
                printf("psn_SigTask      0x%lx\n", psnode->psn_SigTask);
                                                    /* The task to signal when the */
                                                    /* visitor is gone */
                printf("psn_SigBit       %ld\n\n", psnode->psn_SigBit);
                                                    /* The signalbit number to use */
                                                    /* to signal the task */

                if (psnode->psn_Node.ln_Name)
                    FreeMem(psnode->psn_Node.ln_Name, strlen(psnode->psn_Node.ln_Name) + 1);
                Remove((struct Node *)psnode);
                FreeMem(psnode, sizeof(struct PubScreenNode));
                psnode = copy_psnode;
            }
            FreeMem(copy_publist, sizeof(struct List));
        }
        CloseLibrary(IntuitionBase);
    }
}
```

Visitor Windows

Opening a visitor window on a public screen is like opening a window on a custom screen except that the window is specifically defined as a visitor. This is done when opening the window by either replacing the CUSTOMSCREEN flag in the (Ext)NewWindow->Type field with PUBLICSCREEN or using a WA_PubScreenName or WA_PubScreen tag. To use the PUBLICSCREEN flag or the WA_PubScreen tag (this tag has a pointer to the public screen as data), the screen must be prevented from closing. Normally this is done by locking the desired public screen. In either case the program must provide a pointer to the public screen if it requires a specific public screen. If an application has no preference towards a particular screen, it can pass NULL as the data for the WA_PubScreen tag to open a window on the default public screen.

The following example shows how to open a visitor window on a specific public screen or, if that screen can't be found, on the default public screen.

```
struct Screen *screen;
struct Window *window;
UBYTE namebuffer[MAXPUBSCREENNAME];

if (!(screen = LockPubScreen("CATScreen"))) {
    /* Can't lock CATScreen, fall back on default */
    /* The method used in this example to fall back on the default
       screen is not necessary and is provided only to illustrate
       the usage of GetDefaultPubScreen().
    */
    GetDefaultPubScreen(namebuffer);
    /* Lock it, so it can't go away. */
    /* If in this split second another screen is made the default
       and this one closes, screen would become NULL and the window
       will open on the default public screen anyway.
    */
    screen = LockPubScreen(namebuffer);
}
if (window = OpenWindowTags(NULL,
                WA_Left, 0, WA_Width, screen->Width,
                WA_Top, screen->BarHeight,
                WA_Height, screen->Height - screen->BarHeight,
                WA_PubScreen, screen,
                WA_Flags,
                WINDOWDRAG|WINDOWDEPTH|WINDOWCLOSE|ACTIVATE|
                        SIMPLE_REFRESH|NOCAREREFRESH,
                WA_Title, "AmigaMail Visitor window", TAG_END)) {
    /* Don't need the lock anymore. */
    UnlockPubScreen(NULL, screen);
                    .
                    .
                    .
    CloseWindow(window);
} else UnlockPubScreen(NULL, screen);   /* OpenWindow failed for
                                           some other reason */
```

In this code example, once it is locked (first by LockPubScreen(), later by the visitor window) the screen can't go away until all its visitors have left. After opening its initial visitor window, an application can open non-visitor windows on a public screen, however these windows will have to be closed *before* releasing the lock on the public screen.

When opening a visitor window, the public screen on which it opens can be specified by using a pointer to the screen (with the WA_PubScreen tag) or by supplying the screen name (using the WA_PubScreenName tag). This latter method is particularly useful where an application prefers a specific public screen, but can run using the default public screen. If the preferred public screen is not present when an application attempts to open a visitor window, the window will either open on the default public screen or will fail to open depending on the WA_PubScreenFallBack tag. If this tag is present and is set to TRUE, the window will open on the default screen. If WA_PubScreenFallBack is not present or is set to FALSE, the window will not open.

Overscan

In release 2.0, Intuition fully supports video overscan. There are four standard overscan specifiers: OSCAN_TEXT, OSCAN_STANDARD, OSCAN_MAX and OSCAN_VIDEO. OSCAN_TEXT is based on user preference settings and indicates a display which is within the visible bounds of the monitor. The dimensions of this type of overscan are used for the Workbench screen and for the defaults for OpenScreenTagList(), STDSCREENWIDTH and STDSCREENHEIGHT. OVERSCAN_STANDARD is also based on user preference settings. The edges of an OVERSCAN_STANDARD display are set by the user via *Preferences* to be just outside the visible bounds of the monitor. OSCAN_MAX is the largest display fully supported by Intuition. OSCAN_VIDEO is the largest display region which, for a given display mode, can be reliably generated. Note that OSCAN_VIDEO displays are not scrollable.

The Intuition function QueryOverscan() returns rectangle information for the indicated overscan type of a particular display mode. Using the rectangle returned by QueryOverscan(), it is possible to explicitly specify the offset and dimensions of the DisplayClip region. Note however that this custom rectangle must fit within the OSCAN_MAX rectangle, offset included. It is not permitted to specify custom rectangles whose values are in between OSCAN_MAX and OSCAN_VIDEO, nor is it permitted to specify rectangles larger than OSCAN_VIDEO.

DisplayClip

The DisplayClip defines the on-monitor region, and is independent of the screen dimension. The rectangle describing the DisplayClip determines how much of the screen can be seen at a time. The screen is "shown through" the DisplayClip in much the same way a SuperBitmap is shown through a window. If the screen is larger than the DisplayClip, only part of the screen will be visible. The DisplayClip makes it is possible for Intuition to support hardware scrolling of a raster larger than can fit on the display. Intuition will take care of specifying the rectangle of the DisplayClip region based on the default screen dimensions or based on the SA_Overscan tag (if it is present), so most programs shouldn't have to specify the DisplayClip rectangle.

Example 3, *ScreenDisplayModes.c*, illustrates opening any type of screen currently available to the system, using any type of available overscan.

```
/*
 * V36 Simple public screen example.
 *
 * Compiled with SAS C 5.10:  lc -cfist -v -L pub.c
 * Use V36 include files.
 */

#include <intuition/intuition.h>
#include <intuition/screens.h>
#include <graphics/displayinfo.h>
#include <libraries/gadtools.h>
#include <exec/memory.h>
#include <dos/dosextens.h>

#include <clib/exec_protos.h>
#include <clib/gadtools_protos.h>
#include <clib/intuition_protos.h>

#include <pragmas/exec_pragmas.h>
#include <pragmas/gadtools_pragmas.h>
#include <pragmas/intuition_pragmas.h>

struct IntuitionBase *IntuitionBase;
struct Library *GadToolsBase;

static UWORD dri_Pens[] =
{0, 1, 1, 2, 1, 3, 1, 0, 3, ~0};

/* Gadtools menu stuff */
#define QUIT 1
struct NewMenu sdm_menu[] =
{
    {NM_TITLE, "Project", 0, 0, 0, 0,},
    {NM_ITEM, "Quit", "Q", 0, 0, (void *) QUIT,},
    {NM_END, NULL, 0, 0, 0, 0,},
};

struct EasyStruct failedES =
{
    sizeof(struct EasyStruct), 0, "AMPub",
    "%s",
    "OK",
};

void main(void);

void
main(void)
{

    struct Screen *pubscreen;
    struct Window *window;
    struct Menu *menu;
    void *vi;

    struct IntuiMessage *msg;
    UBYTE defaultpubname[MAXPUBSCREENNAME];
    UWORD oldstatus;
    UWORD oldmodes;
    ULONG signal, wsignal, lastsignal, allocsignal;
    ULONG oserror;
    BOOL ABORT = FALSE;
    BOOL CLOSEDOWN = FALSE;
    struct Task *task;

    /* Fails silently if not V36 */
    if (IntuitionBase = OpenLibrary("intuition.library", 36)) {
        if (GadToolsBase = OpenLibrary("gadtools.library", 36)) {
            if ((allocsignal = AllocSignal(-1)) != -1) {
                lastsignal = 1 << allocsignal;

                /* We'll use our task address to get signaled when the last
                 * visitor window leaves. */
                task =
                  (struct Task *)&((struct Process *)FindTask(NULL))->pr_Task;

                /* Get the name of the currently default
                 * public screen (normally WB) */
                GetDefaultPubScreen(defaultpubname);

                /* Note that no checking is done to make sure the
                 * public screen name is unique.  If the public name is
                 * not unique, OSERR_PUBNOTUNIQUE is returned in an
                 * application supplied variable as data for the SA_ErrorCode
                 * tag.  In this case however, if OpenScreen fails, for
                 * whatever reason, we just bail out.
                 */

                if (pubscreen = OpenScreenTags(NULL,
                                SA_DisplayID, HIRES_KEY,
                                SA_Depth, 2,
                                SA_Title,  "AmigaMail Test Public Screen",
                                SA_PubName,"AmigaMail Test Public Screen",

                                SA_PubSig, allocsignal,
                                SA_PubTask, task,
                                        /* Normally you'd supply 0L, if you
                                        * the task which opened the screen to
                                        * be signaled.
                                        */
                                SA_Pens, dri_Pens, SA_ErrorCode, &oserror,
                                TAG_END)) {
                    if (menu = CreateMenus(sdm_menu, TAG_DONE)) {
                        if (window = OpenWindowTags(NULL,
                                WA_Top, pubscreen->BarHeight + 1,
                                WA_Height, pubscreen->Height
                                        - (pubscreen->BarHeight + 1),
                                WA_CustomScreen, pubscreen,
                                WA_IDCMP, MENUPICK,
                                WA_Flags, ACTIVATE|BACKDROP|
                                        BORDERLESS|NOCAREREFRESH,
                                TAG_END)) {

                            vi = GetVisualInfo(pubscreen, TAG_END);
                            if (LayoutMenus(menu, vi, TAG_DONE)) {
                                SetMenuStrip(window, menu);

                                /* Now we have a screen, named "AmigaMail Test
                                 * Public Screen", which is still marked
                                 * private, but ready to be made public.
                                 */
                                oldstatus = PubScreenStatus(pubscreen, 0);
                                /* Now it is really public. We'll make it the
                                 * default (and shanghai attempts to open
                                 * windows on the Workbench.
                                 */
                                SetDefaultPubScreen(
                                        "AmigaMail Test Public Screen");

                                oldmodes = SetPubScreenModes(SHANGHAI|
                                                POPPUBSCREEN);

                                wsignal = 1 << window->UserPort->mp_SigBit;

                                do {
                                    signal = Wait(wsignal|lastsignal);
                                    /* The last visitor just left our screen */
                                    if (signal & lastsignal) {
                                        if (CLOSEDOWN)
                                            if ((oldstatus =
                                                PubScreenStatus(pubscreen,
                                                        PSNF_PRIVATE)) & 1)
                                                ABORT = TRUE;
                                    }

                                    /* If not wsignal, this while-loop will not
                                     * be executed.
                                     */
                                    while(msg = (struct IntuiMessage *)
                                          GetMsg(window->UserPort)) {
                                        if (msg->Class == MENUPICK) {
                                            if ((UWORD)(MENU_USERDATA
                                                    (ItemAddress(menu,
                                                        msg->Code))) == QUIT) {
                                                /* If we can't make our screen
                                                 * private again, we got
                                                 * visitor window(s). Note
                                                 * window(s) you open without
                                                 * specifiying SA_PubScreenName,
                                                 * are NOT considered visitor
                                                 * windows.  So it's easy to try
                                                 * to make your public screen
                                                 * private again, without having
                                                 * to close down your own windows
                                                 * first.
                                                 */

                                                if ((oldstatus =
                                                    PubScreenStatus(pubscreen,
                                                            PSNF_PRIVATE)) & 1) {
                                                    ABORT = TRUE;
                                                }
                                                else {
                                                    /* Close as soon as possible */
                                                    CLOSEDOWN = TRUE;
                                                    EasyRequest(window,
                                                            &failedES,
                                                            NULL,
"Can't make screen private.\nPlease close all windows");
                                                }
```

```
                                }
                            }
                            ReplyMsg((struct Message *)msg);
                        }
                    } while (ABORT == FALSE);

                    /* Restore orignal default */
                    SetDefaultPubScreen(defaultpubname);
                    ClearMenuStrip(window);
                    FreeVisualInfo(vi);
                } else
                    EasyRequest(NULL,
                                &failedES,
                                NULL,
                                "Can't layout menu's");
                CloseWindow(window);
            } else
                EasyRequest(NULL,
                            &failedES,
                            NULL,
                            "Can't open window");
            FreeMenus(menu);
        } else EasyRequest(NULL,
                           &failedES,
                           NULL,
                           "Can't create menu's");
        CloseScreen(pubscreen);
    } else
        EasyRequest(NULL,
                    &failedES,
                    NULL,
                    "Can't open public screen");
    FreeSignal(allocsignal);
} else
    EasyRequest(NULL, &failedES, NULL, "No signal available");
    CloseLibrary(GadToolsBase);
}
CloseLibrary(IntuitionBase);
}
```

```
/*
 * V36 Clone Workbench screen
 *
 * Compiled with SAS C 5.10:  lc -cfist -v -L CloneWB.c
 * Use V36 include files.
 *
 */

#include <stdio.h>
#include <stdlib.h>
#include <intuition/intuition.h>
#include <intuition/screens.h>
#include <graphics/displayinfo.h>

#include <clib/exec_protos.h>
#include <clib/intuition_protos.h>
#include <clib/graphics_protos.h>

#include <pragmas/exec_pragmas.h>
#include <pragmas/intuition_pragmas.h>
#include <pragmas/graphics_pragmas.h>

struct IntuitionBase *IntuitionBase;
struct GfxBase *GfxBase;

struct EasyStruct failedES = {
    sizeof(struct EasyStruct), 0, "CWB",
    "%s",
    "OK",
};

void            main(void);

void
main(void)
{
    struct Screen *wbscreen;
    struct Screen *clonescreen;
    struct Window *window;
    struct ViewPort *vp;
    struct IntuiMessage *msg;
    ULONG modeID;

    struct DisplayInfo displayinfo;
    struct MonitorInfo monitorinfo;
    struct DimensionInfo dimensioninfo;
    struct NameInfo nameinfo;
    struct DrawInfo *drawinfo;

    ULONG result;

    /* Fails silently when not V36 */
    if (IntuitionBase = OpenLibrary("intuition.library", 36)) {
        if (GfxBase = OpenLibrary("graphics.library", 36)) {

            if (wbscreen = LockPubScreen("Workbench")) {
                /* Using intuition.library/GetScreenDrawInfo(), we get the pen
                 * array we'll use for the screen clone the easy way. */
                drawinfo = GetScreenDrawInfo(wbscreen);

                vp = &(wbscreen->ViewPort);
                /* Use graphics.library/GetVPModeID() to get the ModeID of the
                 * Workbench screen. */
                if ((modeID = GetVPModeID(vp)) != INVALID_ID) {
                    /* OK, we got a valid ModeID for the Workbench
                     * screen (surprise) */

                    /* With just the ModeID, the lock on the Workbench
                     * screen & drawinfo->dri_Pens we're able to clone the
                     * Workbench exactly, displaymode and all. When you want
                     * to know everything there is to know about this
                     * displaymode, use graphics.library/GetDisplayInfoData().
                     */
                    /* 'result' is the actual # of bytes copies
                     * into the buffer.
                     * See graphics/displayinfo.h for definitions
                     * of the various structures.
                     */
                    result = GetDisplayInfoData(NULL,
                                                (UBYTE *)&monitorinfo,
                                                sizeof(struct MonitorInfo),
                                                DTAG_MNTR, modeID);
                    result = GetDisplayInfoData(NULL,
                                                (UBYTE *)&displayinfo,
                                                sizeof(struct DisplayInfo),
                                                DTAG_DISP, modeID);
                    result = GetDisplayInfoData(NULL,
                                                (UBYTE *)&dimensioninfo,
                                                sizeof(struct DimensionInfo),
```

```
                                        DTAG_DIMS,
                                        modeID);
                result = GetDisplayInfoData(NULL,
                                        (UBYTE *)&nameinfo,
                                        sizeof(struct NameInfo),
                                        DTAG_NAME,
                                        modeID);

                /* If you don't want to clone the workbench exactly,
                 * you could use one of the other overscan modes
                 * and/or min/max.
                 * dimensions in dimensioninfo or open a regular screen.
                 */
                if (clonescreen = OpenScreenTags(NULL,
                    /* Could use STDSCREENWIDTH/HEIGHT for non-scrollable
                     * screens. Those make */
                    SA_Width, wbscreen->Width,

                    /* OpenScreen() use the textoverscan values */
                    SA_Height, wbscreen->Height,

                    SA_DisplayID, modeID,

                    SA_Depth, wbscreen->BitMap.Depth,

                    /*Workbench always sizes up to OSCAN_TEXT, so do we */
                    SA_Overscan, OSCAN_TEXT,

                    SA_Pens, drawinfo->dri_Pens,

                    SA_Title, nameinfo.Name,

                    /* Doesn't hurt for screens which don't scroll */
                    SA_AutoScroll, TRUE,

                    TAG_END)) {

                    if (window = OpenWindowTags(NULL,
                        WA_Top, clonescreen->BarHeight + 1,
                        WA_Height, clonescreen->Height
                                        - (clonescreen->BarHeight + 1),
                        WA_CustomScreen, clonescreen,
                        WA_MinWidth, 320,
                        WA_MinHeight, 100,
                        WA_MaxWidth, clonescreen->Width,
                        WA_MaxHeight, clonescreen->Height,

                        /* I'm only interested in CLOSEWINDOW messages */
                        WA_IDCMP, CLOSEWINDOW,
                        WA_Flags, WINDOWSIZING|WINDOWDRAG|
                                WINDOWDEPTH|WINDOWCLOSE|ACTIVATE,
                        WA_Title, "Close to exit.",
                        TAG_END)) {

                        /* Wait for the closewindow message */
                        WaitPort(window->UserPort);
                        /* And remove message from the port */
                        while(msg = (struct IntuiMessage *)
                                GetMsg(window->UserPort))
                            ReplyMsg((struct Message *)msg);
                        CloseWindow(window);
                    } else
                        EasyRequest(NULL, &failedES, NULL,
                                "Can't open window");
                    CloseScreen(clonescreen);
                } else
                    EasyRequest(NULL, &failedES, NULL,
                                "Can't open screen");
            } else
                EasyRequest(NULL, &failedES, NULL, "Invalide ModeID");
            FreeScreenDrawInfo(wbscreen, drawinfo);
            UnlockPubScreen(NULL, wbscreen);
        } else
            EasyRequest(NULL, &failedES, NULL,
                "Can't lock Workbench screen");
        CloseLibrary(GfxBase);
    }
    CloseLibrary(IntuitionBase);
}
```

```
/*
 * V36 Screen Displaymode selector example
 *
 * Compiled with SAS C 5.05:  lc -cfist -v -L ScreenDisplayModes.c
 * Use V36 include files.
 */

#include <string.h>
#include <intuition/intuition.h>
#include <intuition/screens.h>
#include <libraries/gadtools.h>
#include <graphics/displayinfo.h>
#include <graphics/text.h>
#include <exec/memory.h>
#include <exec/ports.h>

#include <clib/exec_protos.h>
#include <clib/intuition_protos.h>
#include <clib/graphics_protos.h>
#include <clib/gadtools_protos.h>
#include <clib/alib_protos.h>

#include <pragmas/exec_pragmas.h>
#include <pragmas/intuition_pragmas.h>
#include <pragmas/graphics_pragmas.h>
#include <pragmas/gadtools_pragmas.h>

#define SWITCH 888
#define QUIT   999

struct IntuitionBase *IntuitionBase;
struct GfxBase *GfxBase;
struct Library *GadToolsBase;

void main(void);
void ShowDisplayModes(struct List * dlist);
struct Screen *OpenAScreen(struct DimensionInfo * di, UBYTE * name,
                           ULONG overscantype);
struct Window *OpenAWindow(struct Screen * screen, ULONG overscantype);

struct DisplayNode {
    struct Node dn_Node;
    struct DimensionInfo dn_Dimensioninfo;
};

/* The workbench compatible pens we'll use for that New Look. */
static UWORD dri_Pens[] = {0, 1, 1, 2, 1, 3, 1, 0, 3, ~0};

/* Gadtools menu stuff */
struct NewMenu sdm_menu[] =
{
    {NM_TITLE, "Project", 0, 0, 0, 0,},
    {NM_ITEM, "Switch Mode", "S", 0, 0, (void *) SWITCH,},
    {NM_ITEM, "Set Overscan", 0, 0, 0, 0,},
    {NM_SUB, "Text", 0, CHECKIT | CHECKED, ~1, (void *) OSCAN_TEXT,},
    {NM_SUB, "Standard", 0, CHECKIT, ~2, (void *) OSCAN_STANDARD,},
    {NM_SUB, "Max", 0, CHECKIT, ~4, (void *) OSCAN_MAX,},
    {NM_SUB, "Video", 0, CHECKIT, ~8, (void *) OSCAN_VIDEO,},
    {NM_ITEM, NM_BARLABEL, 0, CHECKIT, 0, 0,},
    {NM_ITEM, "Quit", "Q", 0, 0, (void *) QUIT,},
    {NM_END, NULL, 0, 0, 0, 0,},
};

UBYTE *OScanDescr[] = {NULL, "OSCAN_TEXT", "OSCAN_STANDARD",
                       "OSCAN_MAX", "OSCAN_VIDEO"};

struct EasyStruct failedES =
{
    sizeof(struct EasyStruct), 0, "SDM",
    "%s",
    "OK",
};

void
main(void)
{
    struct List *dlist;
    struct DisplayNode *dnode;
    struct DisplayNode *wnode, *nnode;

    ULONG modeID;
    ULONG skipID;

    ULONG result;
    struct DisplayInfo displayinfo;
    struct NameInfo nameinfo;

    /* Fails silently if not V36 */
    if (IntuitionBase = OpenLibrary("intuition.library", 36)) {
        if (GfxBase = OpenLibrary("graphics.library", 36)) {
```

```
    if (GadToolsBase = OpenLibrary("gadtools.library", 36)) {
        if (dlist = AllocMem(sizeof(struct List), MEMF_CLEAR)) {
            NewList(dlist);

            /*
             * Don't want duplicate entries in the list for the
             * 'default monitor', so we'll skip the the videomode
             * for which default.monitor is the alias.
             */

            /* INVALID_ID indicates the beginning and the end
            * of the list of available keys.
            */
            modeID = INVALID_ID;

            GetDisplayInfoData(NULL, (UBYTE *) & displayinfo,
                               sizeof(struct DisplayInfo),
                               DTAG_DISP, LORES_KEY);
            if (displayinfo.PropertyFlags & DIPF_IS_PAL)
                skipID = PAL_MONITOR_ID;
            else
                skipID = NTSC_MONITOR_ID;
            while ((modeID = NextDisplayInfo(modeID)) != INVALID_ID) {
                if ((modeID & MONITOR_ID_MASK) != skipID) {
                  /*
                   * For this example,only 'named' keys are accepted.  Others
                   * which have no description are left out
                   * even though they may be available.
                   * HAM and EXTRAHALFBRIGHT are examples of this.
                   * If needed a name could be made like '320x400 HAM Interlace'.
                   */

                    if (result = GetDisplayInfoData(NULL,
                         (UBYTE *) & nameinfo,
                         sizeof(struct NameInfo),
                         DTAG_NAME,
                         modeID)) {
                        result = GetDisplayInfoData(NULL,
                         (UBYTE *) & displayinfo,
                         sizeof(struct DisplayInfo),
                         DTAG_DISP,
                         modeID);
                        if (!(displayinfo.NotAvailable)) {
                            if (dnode =
                     (struct DisplayNode *)
                     AllocMem(sizeof(struct DisplayNode),
                      MEMF_CLEAR)) {
                                result = GetDisplayInfoData(NULL,
                       (UBYTE *) &
                       (dnode->dn_Dimensioninfo),
                       sizeof(struct DimensionInfo),
                       DTAG_DIMS,
                       modeID);
                                /* to keep it short: if NOMEM,
                     * just don't copy
                     */
                                if (dnode->dn_Node.ln_Name
                        = AllocMem(strlen(nameinfo.Name)
                            + 1, MEMF_CLEAR))
                                    strcpy(dnode->dn_Node.ln_Name,
                       nameinfo.Name);
                                AddTail(dlist, (struct Node *) dnode);
                            } else {
                                EasyRequest(NULL, &failedES, NULL,
                             "Out of memory");
                                /* Force modeID to INVALID to break */
                                modeID = INVALID_ID;
                            }
                        }
                    }
                }
            }
            ShowDisplayModes(dlist);

            wnode = (struct DisplayNode *) dlist->lh_Head;
            while (nnode = (struct DisplayNode *)
                   (wnode->dn_Node.ln_Succ)) {

                if (wnode->dn_Node.ln_Name)
                    FreeMem(wnode->dn_Node.ln_Name,
                            strlen(wnode->dn_Node.ln_Name) +1);
                Remove((struct Node *) wnode);
                FreeMem(wnode, sizeof(struct DisplayNode));
                wnode = nnode;
            }
            FreeMem(dlist, sizeof(struct List));
        } else
            EasyRequest(NULL, &failedES, NULL, "Out of memory");
        CloseLibrary(GadToolsBase);
    }
```

```
        CloseLibrary(GfxBase);
    }
    CloseLibrary(IntuitionBase);
  }
}

void
ShowDisplayModes(struct List * dlist)
{
    struct Screen *screen;
    struct Window *window;
    struct Gadget *glist, *gadget, *hitgadget;
    struct DrawInfo *drawinfo;
    struct TextFont *defaultfont;
    struct TextAttr *textattr;
    struct IntuiMessage *imsg;
    struct NewGadget *ng;
    struct Menu *menu;
    struct MenuItem *item;
    void *vi;
    ULONG iclass, icode, code;
    struct DisplayNode *dnode;
    struct DimensionInfo *dimensioninfo;
    ULONG overscantype = OSCAN_TEXT;
    ULONG curmode = 0;
    BOOL ABORT = TRUE, OK;
    int i;


    if (ng = AllocMem(sizeof(struct NewGadget), MEMF_CLEAR)) {
        if (textattr = AllocMem(sizeof(struct TextAttr), MEMF_CLEAR)) {
            if (textattr->ta_Name = AllocMem(48, MEMF_CLEAR)) {

                dnode = (struct DisplayNode *) dlist->lh_Head;

                if (menu = CreateMenus(sdm_menu, TAG_DONE)) {
                    do {
                        dimensioninfo = &(dnode->dn_Dimensioninfo);
                        OK = FALSE;
                        if (screen = OpenAScreen(dimensioninfo,
                              dnode->dn_Node.ln_Name,
                              overscantype)) {
                            drawinfo = GetScreenDrawInfo(screen);
                            defaultfont = drawinfo->dri_Font;
                            strcpy(textattr->ta_Name,
                                defaultfont->tf_Message.mn_Node.ln_Name);

                            textattr->ta_YSize = defaultfont->tf_YSize;
                            textattr->ta_Style = defaultfont->tf_Style;
                            textattr->ta_Flags = defaultfont->tf_Flags;

                            if (window = OpenAWindow(screen, overscantype)) {
                                vi = GetVisualInfo(screen, TAG_END);
                                if (LayoutMenus(menu, vi, TAG_DONE)) {
                                    if (gadget = CreateContext(&glist)) {
                                        ng->ng_LeftEdge =
                                    window->BorderLeft + 10;
                                        ng->ng_TopEdge =
                                    window->BorderTop + 10;
                                        ng->ng_Width =
                                    window->Width -
                                      (window->BorderLeft + 10) -
                                        (window->BorderRight + 10);
                                        ng->ng_Height =
                                    window->Height -
                                      (window->BorderTop + 10) -
                                        (window->BorderBottom + 10) -
                                  (4 + defaultfont->tf_YSize + 2);
                                        ng->ng_TextAttr = textattr;
                                        ng->ng_GadgetText = NULL;
                                        ng->ng_VisualInfo = vi;
                                        ng->ng_GadgetID = 1;
                                        ng->ng_Flags = PLACETEXT_ABOVE;
                                        gadget =
                                    CreateGadget(LISTVIEW_KIND, gadget,
                                         ng, GTLV_Labels, dlist,
                                         GTLV_ShowSelected, NULL,
                                         GTLV_Selected, curmode,
                                         TAG_END);

                                        ng->ng_TopEdge +=
                                    gadget->Height +
                                      defaultfont->tf_YSize + 10;
                                        ng->ng_Width = 80;
                                        ng->ng_LeftEdge =
                                    ((window->Width - window->BorderLeft
                                      - window->BorderRight) / 2) - 30;
                                        ng->ng_Height = defaultfont->tf_YSize + 8;
                                        ng->ng_GadgetID = 2;
                                        ng->ng_GadgetText = "OK";
```

```
                                ng->ng_VisualInfo = vi;
                                ng->ng_Flags = PLACETEXT_IN;
                                gadget =
                            CreateGadget(BUTTON_KIND, gadget,
                                ng, TAG_END);

                                AddGList(window, glist, -1, -1, NULL);
                                RefreshGList(glist, window, NULL, -1);
                                GT_RefreshWindow(window, NULL);
                                SetMenuStrip(window, menu);
                                ABORT = FALSE;
                            } else
                                EasyRequest(window, &failedES, NULL,
                             "Can't create gadget context");
                            } else
                                EasyRequest(window, &failedES, NULL,
                           "Can't layout menus");

                            do {
                                WaitPort(window->UserPort);
                                while (imsg = GT_GetIMsg(window->UserPort)) {
                                    iclass = imsg->Class;
                                    icode = imsg->Code;
                                    hitgadget =
                            (struct Gadget *) imsg->IAddress;
                                    GT_ReplyIMsg(imsg);

                                    switch (iclass) {
                                    case GADGETUP:
                                        if (hitgadget->GadgetID == 1) {
                                            dnode =
                            (struct DisplayNode *)
                             dlist->lh_Head;
                                            for (i = 0; i < icode; i++)
                                            dnode =
                            (struct DisplayNode *)
                             dnode->dn_Node.ln_Succ;
                                            curmode = i;
                                        }
                                        if (hitgadget->GadgetID == 2)
                                            OK = TRUE;
                                        break;
                                    case MENUPICK:
                                        while ((icode != MENUNULL)
                             && (ABORT == FALSE)) {
                                            item = ItemAddress(menu, icode);

                                            code = (ULONG) MENU_USERDATA(item);
                                            if (code == QUIT)
                                                ABORT = TRUE;
                                            else if
                                                (code == SWITCH)
                                                OK = TRUE;
                                            else
                                                overscantype = (ULONG) code;
                                            icode = item->NextSelect;
                                        }
                                        break;
                                    case CLOSEWINDOW:
                                        ABORT = TRUE;
                                        break;
                                    }
                                }
                            } while (ABORT == FALSE && OK == FALSE);
                            ClearMenuStrip(window);
                            CloseWindow(window);
                            FreeVisualInfo(vi);
                            FreeGadgets(glist);
                        } else
                            EasyRequest(NULL, &failedES, NULL,
                             "Can't open window");
                        FreeScreenDrawInfo(screen, drawinfo);
                        CloseScreen(screen);
                    } else
                        EasyRequest(NULL, &failedES, NULL,
                         "Can't open screen");
                } while (ABORT == FALSE);
                FreeMenus(menu);
            } else
                EasyRequest(NULL, &failedES, NULL, "Can't create menus");
            FreeMem(textattr->ta_Name, 48);
        } else
            EasyRequest(NULL, &failedES, NULL, "Out of memory");
        FreeMem(textattr, sizeof(struct TextAttr));
    } else
        EasyRequest(NULL, &failedES, NULL, "Out of memory");
    FreeMem(ng, sizeof(struct NewGadget));
} else
    EasyRequest(NULL, &failedES, NULL, "Out of memory");
}
```

```
/*
 * It's advised to use one of the overscan constants and
 * STDSCREENWIDTH and STDSCREENHEIGHT. For this example however, we'll
 * skip all that an use QueryOverscan to get the rectangle describing the
 * requested overscantype and pass that as the displayclip description.
 * Actually, since we pass the standard rectangle from the display database,
 * it is equivalent to the prefered:
 *
 * screen = OpenScreenTags(NULL,
 *                         SA_DisplayID, di->Header.DisplayID,
 *                         SA_Overscan, overscantype,
 *                         SA_Width, STDSCREENWIDTH,
 *                         SA_Height, STDSCREENHEIGHT,
 *                         SA_Title, name,
 *                         SA_Depth, 2,
 *                         SA_SysFont, 1,
 *                         SA_Pens, dri_Pens,
 *                         TAG_END);
 */

struct Screen *
OpenAScreen(struct DimensionInfo * di, UBYTE * name, ULONG overscantype)
{

    struct Rectangle rectangle;

    /* Can't fail, already made sure it's a valid displayID */
    QueryOverscan(di->Header.DisplayID, &rectangle, overscantype);


    return (OpenScreenTags(NULL,
                           SA_DisplayID, di->Header.DisplayID,
                           SA_DClip, &rectangle,
                           SA_Title, name,
                           SA_Depth, 2,
                           SA_SysFont, 1,   /* Use the prefered WB screen font */
                           SA_Pens, dri_Pens,
                           TAG_END));
}

struct Window *
OpenAWindow(struct Screen * screen, ULONG overscantype)
{
    return (OpenWindowTags(NULL,
                           WA_Top, screen->BarHeight + 1,
                           WA_Height, screen->Height - (screen->BarHeight + 1),
                           WA_CustomScreen, screen,
                           WA_IDCMP, CLOSEWINDOW | LISTVIEWIDCMP | MENUPICK,
                           WA_Flags, WINDOWCLOSE | ACTIVATE,
                           WA_Title, OScanDescr[overscantype],
                           TAG_END));
}
```

❖

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Master Index for Amiga Documentation (Preliminary)

This index is designed to simplify extracting information from Amiga technical documentation. It indexes Amiga technical documentation available from CATS as well as other sources, including the RKMs and Bantam's *AmigaDOS Manual.* As this index is preliminary, it is subject to change without notice. It is provided here to elicit feedback from developers and to furnish subscribers with a master index with the least possible delay. Comments and suggestions should be sent to:

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All index entries are indexed by either by *KEY.chapter number.subheading number* or *KEY.disk number.directory number*, where KEY is one of he following:

86DN	1986 Devcon Notes (No longer available)
88DN	1988 Devcon Notes
88d	1988 Devcon Disks (4 disks)
89DN	1989 Devcon Notes
89d	1989 Devcon Disks (2 disks)
90DN	1990 Devcon Notes
90d	1990 Devcon Disks (3 disks)
A1000	A1000 Schematics and Expansion Specs
ADOS	AmigaDOS Manual 2nd Edition (Bantam Books ISBN 0-553-34440-0)
AMT1	AmigaMail Tech Notes (Volume 1)
EN13	1.3 Enhancer Manual
HW	Amiga Hardware Manual (Addison-Wesley ISBN 0-201-18157-6)
IA	Amiga RKM Includes and Autodocs (Addison-Wesley ISBN 0-201-18177-0)
IFFd	EA IFF Disk 1988 (also Fish Disk 185)
IFF	IFF Manual 1988 (also in 1.3 Includes and Autodocs book)
LDd	Addison-Wesley Companion Disks (lharcs on Fish Disk 344)
LD	Amiga RKM Libraries and Devices (Addison-Wesley ISBN 0-201-18187-8)
ND13	1.3 Native Developer Update (4 disks)
ND20	2.0 Native Developer Update (4 disks)
SWT	Software Toolkit (1988)
TREF	A500/A2000 Technical Reference Manual

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From the Desk of Jeff Scherb

The other day I attended a sales meeting for Commodore's Consumer Sales division. Overall, the meeting was upbeat, since everyone believes we're going to have a great Christmas selling season with the A500 in the consumer channel. If there was one recurring theme to the meeting, it had to be this - differentiating the Amiga from everything else on the market is the best way to sell the machine. Commodore and its developers all need to work together to make this successful.

I sat in the sales meeting for two days with people who are working long and hard to sell the Amiga. And how are they doing it? By differentiating the Amiga from everything else on the market. By setting up demos so the buyer can see the difference. By training salespeople to use key Amiga applications. By planning a multi-million dollar ad campaign.

One of the most exciting parts of the meeting was the preview of the fall ad campaign. The basic theme is - "What do you do after your kid's brain outgrows Nintendo?". The ads don't put the Nintendo down, but instead ask the above question and also point out the things that the Amiga does that a simple game box cannot. My favorite TV spot preview goes like this: "Preparing your kid for college? There are scholarships for art (shot of paint program), design (shot of CAD program), writing (word processor)," and so on, until we get to a shot of a kid playing a video game, over which the announcer sadly says, "But there are no scholarships for Super Mario Brothers." This multi-million dollar campaign includes TV, newspapers, and magazines (like *People*). The ads specifically focus on differentiating the Amiga from the other choices the consumer can make.

I left the meeting feeling that the Amiga would finally achieve its long term success, but another thought cast a shadow over my good feeling. I started to think about a disturbing industry trend that could seriously damage our hopes for the long term success of the Amiga. I'm talking about protecting markets through litigation rather than innovation. The industry giants are bashing each other in the courts over "look and feel." Microsoft, Apple, and Xerox are battling over the appearance of a window on the screen. Lotus is suing Borland over the menu structures in the Quattro spreadsheet. These giants may have the resources to fight these battles, but most Amiga developers don't. Lotus has already put Paperback Software out of business over their spreadsheet.

This trend seems to have infected some Amiga developers. It has been reported to me that the lawyers of one of the larger Amiga developers have been sending letters to one of the newer developers threatening action over the "look and feel" of a particular screen gadget. Elsewhere, two Amiga publishers are countersuing each other over the distribution rights to a certain program. Strangely enough, these same two companies had reportedly been in cooperation with each other where both were in a position to profit.

None of the Amiga developers are big enough to waste money on things like this. If litigation becomes a trend among Amiga developers, everyone will suffer. The Amiga is already behind the other platforms in availability of applications. No Amiga developers will benefit from using the legal system to divide up the same pie among fewer developers. In the long run, there may be no pie left to divide. The only road to success with the Amiga is for all of us to help expand the market. Then we all get to divide up a bigger pie.

Differentiate and innovate, don't litigate. Help us show the world that the Amiga is different and much better. In the professional channel, multimedia is just taking off. The consumer channel is ready for an alternative with more socially redeeming value than a simple game box.

Let's not miss the boat because we are sitting on the dock arguing about which of us has a valid ticket. There's plenty of room for everyone. All aboard!

-JS